

## NEUTRON CAPTURE AND TRANSMISSION MEASUREMENTS ON $^{103}\text{Rh}$ DOWN TO THERMAL ENERGIES

Berthoumieux<sup>1</sup>, Leprêtre<sup>1</sup>, Brusegan<sup>2</sup>, Borella<sup>2</sup>, Schillebeeckx<sup>2</sup>, Siegler<sup>2</sup>, Noguere<sup>3</sup>, Bouland<sup>3</sup>

<sup>1</sup> *CEA DAPNIA/SPhN*

<sup>2</sup> *Institute for Reference Materials and Measurements*

<sup>3</sup> *CEA Cadarache*

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Improved capture cross sections for various stable fission products, with a high capture probability are on the NEA High Priority Nuclear Data Request List. Improved data for stable fission products are motivated by the objective to optimise the use of nuclear power plants. The requests concentrate mainly on the thermal energy and the energy region covering the first strong resonance(s). Improved capture data for certain lanthanides, in both the thermal and fast region, are also required for fuel cycles using reprocessed fuel. To improve the above-mentioned data we initiated a collaboration with the CEA Saclay (F) and started the measurements for the poisoning nucleus  $^{103}\text{Rh}$ . To access the cross section in the thermal energy region, the capture experiments were performed at a 15m-flight path and with the LINAC operating at 40Hz. A boron ionisation chamber was used to measure the neutron flux. Two Bicron  $\text{C}_6\text{D}_6$  detectors were used to determine the capture yield. The background was determined using Cd, Rh, Au, W, Co, Bi and Na filters. The neutron energy scale for the capture measurements in the meV-region is verified by means of the prominent Bragg-reflection cuts in Be at 5.24 and 6.84 meV. The transmission experiments were carried out for energies above 0.14 eV, at a 50m flight path with GELINA operating at 100 Hz. The neutron detector consisted of a 0.25" thick NE912 Li-glass viewed by a 5" EMI KQB 9823 photomultiplier placed outside the neutron beam. A Cd anti-overlap filter was used for this experiment. The background was monitored by the Cd anti-overlap filter and by the black resonance filters of Au, Co, and Na, kept permanently in the beam. The results of both experiments were analysed using the resonance shape analysis codes REFIT and SAMMY. The thermal capture cross section, resulting from a combined analysis of capture and transmission data, is  $140 \pm 2$  b compared to the 145 b reported in the evaluated data files in ENDF/ B-VI. This cross section is in good agreement with results from integral measurements.